

IN THE UNITED STATES COURT OF FEDERAL CLAIMS

LIGADO NETWORKS LLC,
Plaintiff,

v.

THE UNITED STATES OF AMERICA, *et*
al.,
Defendants.

Case No. 1:23-cv-1797

Judge Edward J. Damich

**BRIEF OF *AMICI CURIAE* PRIVATE-SECTOR STAKEHOLDERS
IN SUPPORT OF DEFENDANTS' MOTION TO DISMISS**

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CORPORATE DISCLOSURE STATEMENT

Pursuant to Rule 7.1 of the Rules of the Court of Federal Claims, amici curiae make the following disclosures:

Iridium Communications, Inc. has no parent company, and no publicly traded corporation owns 10% or more of its stock.

Aireon LLC's parent company is Aireon Holdings LLC. Iridium Communications, Inc. holds at least 10% of the stock of Aireon Holdings LLC.

The Air Line Pilots Association, International; Airlines for America; and the International Air Transport Association each has no parent company, and no publicly traded corporation owns 10% or more of their stock.

INTEREST OF AMICI CURIAE

Amici curiae are or represent the interests of private-sector leaders of the defense, communications, and civil aviation industries that provide or rely upon satellite communication services and/or Global Positioning System (GPS) services. Amici have long opposed Ligado's planned use of its satellite spectrum for terrestrial services because it would harmfully interfere with existing, critical communications services using nearby spectrum, jeopardizing amici's ability to support U.S. national security, civil aviation safety, and satellite communication services, and imperiling billions of dollars in economic investment.

Amicus Iridium Communications, Inc. (Iridium) is a global satellite communications company that provides access to a variety of voice and data services anywhere on Earth. Iridium owns and operates a constellation of sixty-six cross-linked satellites in Low-Earth Orbit that collectively cover the entire globe. Iridium's satellites use so-called "L-band" frequencies licensed to Iridium by the Federal Communications Commission (FCC) to enable communications with user devices. Iridium has a unique interest in and perspective on issues raised in this case given Iridium's longstanding opposition to efforts by Ligado to transform the use of neighboring FCC spectrum licensed to Ligado for satellite purposes into widespread terrestrial operations, a result that would cause significant harmful interference to Iridium user devices for critical commercial, governmental, military, and aviation communications.

Amicus Aireon LLC (Aireon) is a global aviation services company, providing reliable, real-time air traffic surveillance data anywhere on earth through a hosted payload operating on the Iridium constellation of low-earth orbit satellites. In partnership with Iridium and the air navigation service providers of countries such as Canada and the United Kingdom (*e.g.*, NAV Canada and NATS UK), Aireon supports its aviation customers' safety missions and allows for

unprecedented levels of visibility into air traffic flow anywhere in the world, including over oceans, the poles, and remote regions. Aireon has an interest in this case given that harmful interference from Ligado's proposed terrestrial operations would jeopardize the critical services Aireon provides.

Amicus the Air Line Pilots Association, International (ALPA) is the largest airline pilot union in the world and represents more than 77,000 pilots at 43 U.S. and Canadian airlines. ALPA members fly using GPS and satellite communication services affected by Ligado's proposal for safety-of-life services, including for aircraft navigation, terrain avoidance, and communication with air traffic control. In addition, ALPA members share the airspace with other aviation users, such as general aviation and uncrewed aerial vehicles that also depend on GPS for their basic navigation. ALPA has an interest in ensuring that the passengers and cargo that fly in our member's aircraft are protected from direct or indirect hazards that would be caused by Ligado.

Amicus Airlines for America (A4A) is the trade association for major U.S. airlines and includes Air Canada as an associate member. A4A advocates on behalf of its members to shape crucial policies and measures that promote safety, security, and a healthy U.S. airline industry. A4A has an interest in this case because Ligado's use of the spectrum licensed to it by the FCC for widespread terrestrial operations would cause disruption of critical airborne communication and navigation systems, harming A4A's member airlines.

Amicus the International Air Transport Association (IATA) is a nongovernmental international trade association founded in 1945 by air carriers engaged in international air services. Today, IATA consists of some 320 member airlines in over 120 countries, representing approximately 83 percent of the world's total air traffic. IATA strives to represent, lead, and

serve the airline industry by advocating the interests of airlines across the globe, developing global commercial standards for the airline industry and assisting airlines in operating safely, securely, efficiently, and economically. Since 1945, IATA has worked closely with governments and intergovernmental organizations to achieve and maintain a legal and regulatory framework everywhere consistent with the best interests of air transportation users. IATA has a unique interest in and perspective on the issues raised in this case given IATA's longstanding opposition to efforts by Ligado operate a nationwide broadband network in the L-band and its continued concern that Ligado's planned deployments will disrupt the reliability of satellite communications, GPS, and weather forecasting services necessary for safety of life in commercial aviation operations.

INTRODUCTION AND SUMMARY OF THE ARGUMENT

Ligado's lawsuit advances assorted claims against the United States and several agencies of the federal government under the Fifth Amendment's Taking Clause that rest on conclusory allegations of a nefarious conspiracy by the government to deprive Ligado of a purported property right to use the spectrum for terrestrial purposes that the FCC has licensed to Ligado for satellite communications. The United States ably explains why Ligado's complaint should be dismissed as a matter of law.¹

As critical stakeholders negatively affected by Ligado's desire to change and expand its use of spectrum regulated by the FCC, amici write separately to explain why Ligado's complaint rests in critical parts on a skewed, misleading narrative regarding the long, contested administrative history related to Ligado's efforts to transform the use of its licensed L-band

¹ See Def.'s Mot. to Dismiss, ECF No. 11 (Jan. 25, 2024) ("U.S. Mot.").

spectrum for satellite communications into a ground-based communications network. As that administrative history makes resoundingly clear, amici and others have serious, substantiated, and ongoing concerns related to Ligado’s proposed expansion of its use of the licensed L-band spectrum. In fact, amici can attest, and have shown in the administrative record before the FCC over many years, that implementation of Ligado’s planned terrestrial operations, as approved by the FCC, would be detrimental to satellite communications and GPS services that are critical components of national security, civil aviation safety, and disaster recovery. These well-documented concerns, although unduly disregarded by the FCC in approving Ligado’s planned terrestrial operations in its 2020 Order (the “*Ligado Order*”),² remain the subject of multiple unresolved petitions for reconsideration before the agency (filed by amici and others)—petitions that raise serious questions about the lawfulness of Ligado’s planned terrestrial use of the spectrum and the FCC’s order conditionally permitting such use.

Although Ligado’s complaint glosses over this regulatory history, amici respectfully submit that this history should inform the Court’s consideration of Ligado’s claims and the government’s motion to dismiss in at least two respects. First, contrary to a central tenet of Ligado’s complaint, the concerns about harmful interference arising from Ligado’s planned terrestrial operations are real and ongoing, not pretextual or resolved. Second, the government’s legal position that Ligado cannot have a cognizable property interest in an FCC license for purposes of the Constitution’s Takings Clause is underscored by the fact that Ligado’s license remains subject to substantial contingencies, including those arising from multiple petitions for

² Order and Authorization, *LightSquared Technical Working Group Report LightSquared License Modification Application*, 35 FCC Rcd. 3772 (2020) (“*Ligado Order*”).

reconsideration pending before the FCC, as well as the possibility of judicial review in the event that the agency denies the reconsideration petitions.

Ligado's complaint should be dismissed.

ARGUMENT

I. THE ADMINISTRATIVE HISTORY REGARDING LIGADO'S EFFORTS TO TRANSFORM SATELLITE SPECTRUM INTO TERRESTRIAL USE DEMONSTRATES THAT THE HARMFUL INTERFERENCE CONCERNS FROM LIGADO'S PROPOSAL ARE GENUINE

Ligado's complaint rests on the spurious premise that various agencies of the federal government have manufactured concerns about harmful interference arising from Ligado's desired terrestrial operations using spectrum usually reserved for satellite communications. Ligado specifically alleges that the Department of Defense (DOD) and the Department of Commerce (DOC) have "made false or misleading claims to the FCC, Congress, the White House, other federal agencies and the public about the effects of Ligado's proposed 5G terrestrial services on Global Position Systems,"³ all "in an effort to effectuate [an] uncompensated taking" of Ligado's licensed spectrum.⁴ Ligado also claims that it has worked to ensure that its terrestrial operations would "coexist with all other known services operating in nearby spectrum."⁵ Those claims are false. In fact, Ligado's central allegations regarding conspiratorial conduct and harmful interference are contradicted by the extensive administrative record amassed during the long dispute before the FCC over Ligado's efforts to establish a terrestrial wireless network, as well as findings by the National Academy of Sciences that post-date the FCC's *Ligado Order*.

³ Compl. ¶ 2; *see also id.* ¶¶ 5-7, 40, 48, 61-62, 89-90, 93-95.

⁴ *Id.* ¶ 7; *see also id.* ¶¶ 5, 6, 48, 62.

⁵ *Id.* ¶ 3.

As active participants in those FCC proceedings, amici can attest that for more than a decade, numerous government agencies and private actors have raised legitimate, evidence-based concerns of harmful interference to both satellite communications and GPS by Ligado's planned terrestrial use of the spectrum licensed to it for satellite communications. During the FCC proceedings, amici Iridium and Aireon, among others, documented the dangerous interference that Ligado's proposed terrestrial operations would pose to satellite communication services provided by Iridium—services that provide, for example, the U.S. military and law enforcement with mission-critical support.

These proceedings also demonstrated the independent threat to GPS, a concern long advanced by the National Telecommunications and Information Administration (NTIA) (representing the Executive Branch), DOD, DOC, the Department of Transportation (DOT), and the Federal Aviation Administration (FAA). Leaders of the commercial GPS industry echoed these grave concerns, substantiating them with numerous studies and analyses demonstrating the threat to national security and civil aviation. The risks to both satellite communication services and GPS, moreover, have been confirmed by leaders of the civil aviation industries, including amici the Air Line Pilots Association, Airlines for America, and the International Air Transport Association. These entities have long warned of the dangers posed by Ligado's proposal to critical aviation safety-of-life services, including air navigation services and air traffic control communications. As described in more detail below, this administrative history forecloses Ligado's conclusory allegations that harmful interference concerns are pretextual.

A. Ligado Has Failed To Resolve Longstanding Safety Concerns Shared By A Wide Range Of Stakeholders During A Long-Running FCC Proceeding

For more than two decades, Ligado (and its predecessors in interest) have held FCC licenses to provide mobile-satellite services in parts of the L-band spectrum designated for mobile-satellite services. Designated mobile-satellite communication services are compatible with the GPS satellite service and other satellite communications that operate in nearby frequencies also in the L-band, creating a peaceful spectrum neighborhood.⁶ The longstanding concerns with Ligado’s proposal arise not from Ligado’s original mobile-satellite service license, but from Ligado’s effort to “fundamentally” alter that license by seeking FCC authority to provide terrestrial services⁷—that is, communications services facilitated by a network of ground-based stations and wireless receivers—and the *Ligado Order* authorizing it to do so.

While mobile-satellite services typically involve “a mobile, space-to-earth band containing very

⁶ Ligado holds mobile-satellite services licenses for the 1525-1559 MHz and 1626.5-1660.5 MHz bands. Under the *Ligado Order*, Ligado would be permitted to operate a terrestrial network in the 1526-1536, 1627.5-1637.5, and 1646.5-1656.5 MHz sub-bands, as licensed to Ligado for mobile-satellite services. Iridium holds a license to and provides mobile-satellite services in the 1617.775-1626.5 MHz band, which is adjacent to Ligado’s 1626.5-1660.5 MHz band, though, under the *Ligado Order*, there is one megahertz of vacant spectrum known as a “guard band” separating the 1627.5-1637.5 MHz band licensed to Ligado for terrestrial purposes and Iridium’s 1617.775-1626.5 MHz band. Meanwhile, the 1559-1610 MHz band of the L-band is allocated for navigation satellite services (including GPS) and is similarly separated from the 1526-1536 MHz band licensed to Ligado under the *Ligado Order* for terrestrial purposes by a one megahertz guard band. A one megahertz guard band between terrestrial and mobile-satellite service operations is insufficient for protecting Iridium against harmful interference from terrestrial operations by Ligado, the new entrant to the spectrum neighborhood. This is equivalent to having a noisy neighbor separated by only a paper-thin wall. Cf. Petition for Reconsideration of Iridium et al., FCC IB Docket No. 11-109, attach. at 1-2 (May 22, 2020) (“*Iridium Petition for Reconsideration*”) (documenting how Iridium would still experience harmful interference from Ligado’s proposed network under the parameters adopted in the *Ligado Order*).

⁷ See Scott Burgett & Bronson Hokuf, Garmin Int’l, *Experimental Evidence of Wide Area GPS Jamming That Will Result From LightSquared’s Proposal to Convert Portions of L-Band 1 to High Power Terrestrial Broadband*, at 1 (Jan. 16, 2011) (“*Garmin Report*”).

weak signals,” Ligado’s proposed terrestrial services would transform the L-band into “a very noisy terrestrial broadband band full of extremely powerful signals” that pose a significant risk of harmful interference to services using nearby frequencies.⁸

In plain English, Ligado proposes to reuse satellite spectrum for the purpose of building out a ground-based 5G wireless network, rather than obtaining spectrum allocated for terrestrial mobile broadband use, whether through an FCC auction or the secondary market. This proposal is highly significant from a spectrum-interference perspective given that the size and intensity of a ground-based mobile broadband network will necessarily create serious harmful interference with other approved satellite-based L-band uses. The long-running objections to Ligado’s terrestrial operations are thus akin to objections to tearing down a single-family home in a quiet residential neighborhood and replacing it with a large noisy factory with harmful emissions.⁹

Ligado first obtained so-called “ancillary terrestrial component” (ATC) authority from the FCC in 2004, shortly after the FCC established rules permitting mobile-satellite service licensees in certain circumstances to seek authority to operate ground-based stations, with the idea that these operations would be integrated with and ancillary to satellite operations. Recognizing that terrestrial operations in spectrum reserved for mobile-satellite services would increase interference risks, the FCC established rules requiring operators to “resolve any [harmful] interference” that their ATC operations “caused to other services.”¹⁰ Even though

⁸ *Id.*

⁹ Stakeholders objecting to Ligado’s proposal have made comparable analogies before. *Cf., e.g.,* Petition for Reconsideration of Lockheed Martin, FCC IB Docket No. 11-109, at 2 (May 22, 2020) (“The impact of the FCC’s decision is tantamount to permitting a deafening nuisance into a quiet residential neighborhood over the objections of affected neighbors.”) (“*Lockheed Martin Petition for Reconsideration*”).

¹⁰ 47 C.F.R. § 25.255.

Ligado's 2004 ATC authority was more limited than authority it later sought from the FCC, its original proposal generated early concerns from federal agencies and others regarding harmful interference with GPS and satellite communications.¹¹ Ultimately, as documented by the FCC itself in 2011, Ligado never launched terrestrial services under its more limited 2004 authority.¹²

In 2010, Ligado sought permission from the FCC to expand its ATC authority. Specifically, despite not having actually used the ATC authority issued in 2004, Ligado asked the FCC to waive certain additional ATC requirements to enable Ligado to then build a 4G wireless network, which, as NTIA explained at the time, entailed "a large increase in terrestrial usage" and a corresponding increase in the risk of harmful interference.¹³ NTIA specifically identified concerns that the new proposal would jeopardize GPS and Global Navigation Satellite System operations, "maritime and aeronautical emergency communication systems," and "Inmarsat receivers used by" different federal agencies.¹⁴ Numerous other parties, including some of the amici, raised similar concerns in their comments on the proposed expanded ATC authority requested by Ligado at that time.

Ligado's 2010 submission was the first in a series of filings to the FCC over a decade in which Ligado sought authority to build an extensive terrestrial network. At each step, Ligado's

¹¹ See Order and Authorization, *Mobile Satellite Ventures Subsidiary LLC*, 19 FCC Rcd. 22144, 22147-48 ¶¶ 9-10 (2004) (noting concerns raised by NTIA and satellite service provider Inmarsat).

¹² See Order and Authorization, *LightSquared Subsidiary LLC Request for Modification of its Authority for an Ancillary Terrestrial Component*, 26 FCC Rcd. 566, 568 ¶ 4 (2011) ("2011 Order") (explaining that Ligado "was not offering any terrestrial service using its ATC authority" in 2011).

¹³ See Letter from Lawrence E. Strickling, Adm'r, Nat'l Telecomms. & Info. Admin., to Julius Genachowski, Chairman, FCC, at 2 (Jan. 12, 2011).

¹⁴ *Id.* at 1.

submissions drew persistent, substantiated, and widespread opposition from governmental and private stakeholders alike. With respect to GPS, for example, a range of actors from government and private sector aviation and GPS industries warned that Ligado's proposed terrestrial network would harmfully interfere with GPS.¹⁵ A report by Garmin showed that Ligado's proposed network would cause "widespread, severe GPS jamming," compromising a wide range of GPS devices, including FAA-certified receivers and consumer automotive navigation devices.¹⁶

An additional concern raised with Ligado's 2010 proposal was that it failed to satisfy the FCC's integrated service rule, which seeks to ensure that terrestrial operations in fact remain ancillary to the primary mobile-satellite service operations. While the FCC unjustifiably waived that rule in its *2011 Order*, the agency conditioned its waiver on Ligado taking steps to address harmful interference. The FCC specifically agreed with commenters in 2011 that the potential harmful interference with GPS was a "significant concern."¹⁷ The FCC accordingly established a working group composed of Ligado and federal agencies to assess the threat of harmful interference.¹⁸ The process was to be complete only "once the [FCC], after consultation with NTIA, conclude[d] that the harmful interference concerns have been resolved."¹⁹ Ligado was thus prohibited under the *2011 Order* from commencing commercial services until the working process was complete and harmful interference concerns were resolved.

¹⁵ See, e.g., *id.*; Comments of the U.S. GPS Industry Council, FCC IB Docket No. 11-109, at 1-5 (Aug. 1, 2011).

¹⁶ *Garmin Report*, at 1.

¹⁷ *2011 Order*, 26 FCC Rcd. 566, 585 ¶ 39.

¹⁸ *Id.* at 585-586 ¶¶ 39-40.

¹⁹ *Id.* at 587 ¶ 43.

Members of the working group, however, confirmed the risks of harmful interference inherent in Ligado’s proposed terrestrial network and concluded there was no workable solution. After months of testing with Ligado, key federal agencies—including the FAA and DOD—informed NTIA of their “‘unanimous conclusion’” that Ligado’s planned network would interfere with a range of GPS devices, including DOD devices and aircraft safety-of-flight systems.²⁰ NTIA independently assessed the issue and told the FCC in 2012 that there was “no practical way to mitigate” this harmful interference.²¹

In the face of these findings and the sustained, evidence-based opposition to its terrestrial proposal, Ligado submitted a new application to the FCC in the fall of 2012, which purported to resolve harmful-interference concerns.²² But, once again, multiple federal agencies and private sector stakeholders—including NTIA, DOT, and GPS industry leaders—determined that Ligado’s modified proposal remained wholly insufficient to resolve harmful interference concerns and submitted substantial evidence to the FCC demonstrating making that point.²³

Undeterred, Ligado submitted yet another application to the FCC in 2015 seeking to modify its ATC authority, now with an ambitious plan to build a terrestrial 5G network.²⁴ This time, Ligado proposed to operate under more stringent out-of-band emissions requirements (that

²⁰ Letter from Lawrence E. Strickling, Adm’r, Nat’l Telecomms. & Info. Admin., to Julius Genachowski, Chairman, FCC, at 2 (Feb. 14, 2012) (“*2012 NTIA Letter*”).

²¹ *Id.* at 1.

²² LightSquared Subsidiary LLC, Modification of Terrestrial Rights, File No. SAT-MOD-20120928-00160, FCC IB Docket 11-109 (Sept. 28, 2012).

²³ *See, e.g.*, Letter from Karl B. Nebbia, Assoc. Adm’r, Nat’l Telecomms. & Info. Admin., to Julius Knapp, Chief, Off. of Eng’g & Tech., FCC (July 1, 2014) (attaching a letter from DOT and recounting significant opposition to Ligado’s modified proposal).

²⁴ *See* LightSquared Subsidiary, Application for Modification, File No. SAT-MOD-20151231-00090, FCC IB Docket No. 11-109 (Dec. 31, 2015).

is, limitations on the amount of radio frequency emissions in the bands immediately outside and near the authorized frequencies). Once again, however, Ligado’s plan produced a wave of opposition from the public and private sectors. For example, the Space-Based Positioning Navigation & Timing National Advisory Board, which provides independent advice to the U.S. government on GPS, concluded that Ligado’s 2015 proposal was “fundamentally unchanged from [its] previous proposal,” and that “[e]xtensive government testing in 2011 and 2016, clearly shows that both proposals cause definitive harmful interference to many classes of GPS receivers.”²⁵

Private GPS stakeholders Garmin and Trimble emphatically expressed concerns and objected to Ligado’s representations that its proposed limits were the product of “co-existence agreements” between major GPS device manufacturers, including themselves and Deere & Company.²⁶ Garmin explained that, contrary to Ligado’s assertions, it never entered into any co-existence agreement; rather, it settled litigation, but without resolving “the ongoing and serious safety risks that Ligado’s terrestrial network poses” to GPS-facilitated “safety-of-life services.”²⁷

²⁵ Letter from John Stenbit, Chair, Nat’l Space-Based Positioning, Navigation, & Timing Advisory Bd. to Robert O. Work, Dep. Sec’y of Def., & Jeffrey A. Rosen, Dep. Sec’y of Transp. (July 5, 2017).

²⁶ See Petition for Reconsideration of Trimble Inc., FCC IB Docket No. 11-109, at 3 (May 22, 2020) (“*Trimble Petition for Reconsideration*”); Garmin Int’l, Written Ex Parte Presentation Regarding Certified Aviation Devices and the 1 dB Standard, FCC IB Docket No. 11-109, at 2 (May 15, 2020) (“*Garmin Ex Parte*”); see also Comments of Deere & Company, FCC IB Docket No. 11-109, at 2 (June 1, 2020) (“Deere clarifies that it never entered into a ‘co-existence agreement’ with Ligado.”).

²⁷ *Garmin Ex Parte*, at 3. Ligado repeats this same claim in its complaint, asserting that under “co-existence agreements,” “[a]ll ... major GPS receiver manufacturers” supported its 2015 application. Compl. ¶ 38.

Even one of Ligado's own 2016 studies confirmed that Ligado's proposed network would result in harmful interference to most high-precision GPS devices.²⁸

Ligado's 2015 proposal also failed to resolve the serious risks of harmful interference issues with satellite communications services. In 2016, Iridium submitted to the FCC two studies documenting how Ligado's proposed network would interfere with its satellite services,²⁹ which allow military and civilian users to stay reliably connected while conducting critical land, air, and sea communications—often where there are no other viable communication service alternatives. Iridium's September 2016 technical analysis detailed how, under multiple scenarios, Ligado user devices would produce emissions that leak into Iridium's licensed band and exceed the level of interference Iridium user terminals can tolerate.³⁰ This out-of-band emission interference, moreover, cannot be mitigated by receiver design.³¹ The analysis found that a single Ligado user can cause harmful interference with nearby Iridium user terminals—and in densely populated suburban and urban areas with multiple Ligado users, interference would be more likely.³²

²⁸ See *Ligado Order*, 35 FCC Rcd. 3772 at 3814 ¶ 80 (2020) (describing a Ligado-funded study that found that seven of eleven tested high-precision receivers would be impacted in some way by Ligado).

²⁹ Technical Analysis of Ligado Interference Impact on Iridium User Links, FCC IB Docket No. 11-109 (Sept. 1, 2016) ("*Iridium User Link Analysis*"); Technical Analysis of Ligado Interference Impact on Iridium Aviation Services, FCC IB Docket No. 11-109 (Dec. 14, 2016) ("*Iridium Aviation Services Analysis*").

³⁰ *Iridium User Link Analysis*, at 18.

³¹ See *Iridium Petition for Reconsideration*, attach. at 2. Ligado user devices would cause overload interference to GPS receivers—a different type of interference that is nonetheless dangerous and difficult to address. That both Iridium and GPS devices would be subject to harmful interference is particularly dangerous given that Iridium supports services that are a backup for GPS.

³² *Iridium User Link Analysis*, at 2, 14.

Iridium's subsequent December 2016 technical analysis evaluated interference from Ligado user devices to Iridium aviation terminals, which are used by helicopters and aircraft to provide safety-of-life cockpit communication services. This analysis found, for example, that a single Ligado user in the cabin of a Boeing 747 would produce emissions that harmfully interfere with the plane's Iridium receiver—interference that would be dramatically worse in the presence of additional Ligado users—whether they are in the cabin of the plane, at the airport terminal, or in areas neighboring the airport.³³ The potential of a nearby Ligado user causing interference is particularly worrisome because pilots must complete critical pre-flight ground checks of the satellite communications systems.

The harmful interference that Ligado's proposed terrestrial operations would cause would be severe enough that it would threaten every service Iridium offers in its licensed spectrum. The Iridium network's signaling transmissions in the frequencies nearest to Ligado's licensed spectrum, which are used to support connectivity for all Iridium users, would be particularly vulnerable to harmful interference from Ligado's terrestrial operations. Some of Iridium's specialized services also would be damaged by Ligado's terrestrial service, including Satellite Time and Location (STL) and Iridium Burst—both of which support our national infrastructure and operate in the portion of Iridium's spectrum closest to Ligado's licensed spectrum. STL delivers precise time and location data required for synchronization in support of our nation's critical infrastructure and financial markets, including power grids and the New York Stock Exchange, and provides a resilient alternative to GPS. Iridium Burst, a global data broadcasting service, allows senders to transmit data to receivers anywhere in the world,

³³ See *Iridium Aviation Services Analysis*, at 9-12.

including environments with intense signal obstruction. It is used in warning systems for natural disasters and relied upon by the DOD for command-and-control capabilities. Both STL and Iridium Burst could be rendered inoperable due to Ligado interference.

In 2018, Ligado amended its 2015 application, promising to operate its base stations at reduced power levels and to avoid operating ground-based stations near FAA-designated obstacle clearance surfaces.³⁴ But these changes again failed to alleviate all concerns of government agencies, the aviation industry, satellite communications providers, and others. As NTIA explained in 2019, after a “thorough” assessment of Ligado’s proposal, federal agencies continued to “have significant concerns regarding the impact to their missions, national security, and the U.S. economy.”³⁵ The Air Force reiterated that “[e]xtensive and technically rigorous testing and analysis conducted over the past nine years by DoD, the National Space-based Positioning, Navigation, and Timing Systems Engineering Forum, the Department of Transportation[,] ... and the Air Force has shown ... that the proposed Ligado ... license modification threatens the disruption of GPS.”³⁶ And a coalition of eleven major aviation associations emphasized that “safety issues ... have NOT been addressed” by Ligado’s new application.³⁷

³⁴ See *Ligado Order*, 35 FCC Rcd. at 3782 ¶¶ 15-16 (explaining procedural history); see also Amendment to License Modification Applications, File Nos. SES-MOD20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091, FCC IB Docket 11-109 (May 31, 2018).

³⁵ Letter from Douglas W. Kinkoph, Acting Dep. Ass’t Sec’y for Comm’ns & Info., to Ajit Pai, Chairman, FCC, at 2 (Dec. 6, 2019) (“2019 NTIA Letter”).

³⁶ See Letter from Douglas W. Kinkoph, Assoc. Adm’r, Nat’l Telecomms. & Info. Admin., to Ajit Pai, Chairman, FCC (Apr. 10, 2020) (attaching memorandum from the Air Force).

³⁷ See Letter from Tim Canoll, Pres., Air Line Pilots Ass’n, et al. to Daniel K. Elwell, Acting Adm’r, Fed. Aviation Admin. (June 15, 2018). Power reduction to base stations also holds no benefit to Iridium’s operations. See *Iridium Petition for Reconsideration*, attach. at 2.

In sum, over the course of nearly two decades of administrative proceeding involving, by our count, more than 11,800 filings and 44,000 pages of advocacy, multiple federal agencies and private parties have produced robust evidence of the harmful interference that Ligado's planned terrestrial network would cause and how that would jeopardize billions of dollars in economic activity, and more critically, national security and civil aviation safety.³⁸ This history puts to rest Ligado's claims that various federal agencies manufactured these concerns as part of a conspiracy to deprive Ligado of its purported property rights. To the contrary, these concerns are both real and substantiated, and resoundingly confirmed by leaders of the satellite communications, GPS, and civilian aviation industries.³⁹

B. The FCC's Approval Of Ligado's Modification In 2020 Prompted A Wave Of Petitions For Reconsideration, Confirming Harmful Interference Risks

Despite repeated, evidence-based objections by the Executive Branch as well as private sector stakeholders, including amici here, the FCC approved Ligado's ATC license in 2020, subject to conditions purportedly aimed at reducing some of the harmful interference risks.⁴⁰

³⁸ See, e.g., *2012 NTIA Letter*, at 1-3; *2019 NTIA Letter*, at 2; see also Fed. Aviation Admin., U.S. Dep't of Transp., *Status Report: Assessment of Compatibility of Planned LightSquared Ancillary Terrestrial Component Transmissions in the 1526-1536 MHz Band With Certified Aviation GPS Receivers* (Jan. 25, 2012); U.S. Dep't of Transp., *Global Positioning System (GPS) Adjacent Band Compatibility Assessment* (April 2018).

³⁹ See, e.g., Letter from Tim Canoll, Pres., Air Line Pilots Ass'n, et al. to Daniel K. Elwell, Acting Adm'r, Fed. Aviation Admin. (June 15, 2018); *Garmin Ex Parte*, at 3.

⁴⁰ See *Ligado Order*, at 3773 ¶ 1.

Opposition to the *Ligado Order* was swift and overwhelming. Although the merits of these petitions are not before this Court, they provide an important backdrop to Ligado's claims here.

On behalf of the Executive Branch, NTIA quickly took the extraordinary step of seeking a stay of the *Ligado Order* in addition to filing a petition for reconsideration.⁴¹ In seeking reconsideration, NTIA explained that “[t]he *Ligado Order* failed to adequately consider and give appropriate weight to important and valid Executive Branch concerns about harmful interference to GPS.”⁴² NTIA also explained that the FCC had “failed to consider the major economic impact its decision will have on civilian GPS users and the American economy.”⁴³

In addition, a diverse collection of private sector stakeholders filed seven petitions for reconsideration of the *Ligado Order*. Amici Iridium and Aireon sought reconsideration of the *Ligado Order* based in part on the FCC's failure to reasonably address grave interference risks created by Ligado's proposal for Iridium's L-band satellite operations.⁴⁴ The petition recounted that throughout the FCC proceeding, it was one of many entities that “submitted reams of evidence, argument, and technical analysis showing that Ligado's operations would cause harmful interference, undermining billions of dollars of investment and jeopardizing national security.”⁴⁵ Specifically, amici argued that the FCC had unreasonably dismissed, and apparently misunderstood, the “two-part technical analysis” that Iridium had submitted to the FCC in 2016

⁴¹ Petition for Stay of the Nat'l Telecomms. & Info. Admin., FCC IB Docket No. 11-109 (May 22, 2020).

⁴² Petition for Reconsideration of the Nat'l Telecomms. & Info. Admin., FCC IB Docket No. 11-109, at 3 (May 22, 2020).

⁴³ *Id.* at iv.

⁴⁴ See *Iridium Petition for Reconsideration*, at ii.

⁴⁵ See *id.*

establishing that “Ligado’s terrestrial operations would undoubtedly cause harmful interference to Iridium across a range of deployment scenarios.”⁴⁶

Amicus Air Line Pilots Association, International argued that the FCC “did not fully comprehend or appreciate ... the threat of adverse operational impacts from Ligado’s proposed service.”⁴⁷ Similarly, a coalition of aviation industry associations—including amici Airlines for America and the International Air Transport Association⁴⁸—sought reconsideration on the grounds that the FCC failed to appreciate the harmful interference concerns generated by Ligado’s proposal and that the conditions the FCC imposed, which were designed to limit interference, were undefined or unworkable in key part.⁴⁹ Lockheed Martin, which manufactures and relies on GPS satellites, highlighted the FCC’s failure to engage in reasoned decision making in dismissing critical parts of a “voluminous evidentiary record” demonstrating the interference risks created by the proposal.⁵⁰

In addition to those petitions, the Resilient Navigation and Timing Foundation, an association speaking for the interests of GPS users, argued that the FCC committed numerous procedural violations by failing to conduct a proper cost-benefit analysis accounting for the

⁴⁶ *See id.* at 6-9.

⁴⁷ Petition for Reconsideration of the Air Line Pilots Ass’n, Int’l, FCC IB Docket No. 11-109, at 1 (May 20, 2020).

⁴⁸ The other associations were the Aerospace Industries Association, the Aircraft Owners and Pilots Association, Aviation Spectrum Resources, Inc., the Cargo Airline Association, the General Aviation Manufacturers Association, the Helicopter Association International, the National Air Transportation Association, and the National Business Aviation Association.

⁴⁹ *See* Petition for Reconsideration of the Aerospace Indus. Ass’n et al., FCC IB Docket No. 11-109, at 3 (May 22, 2020).

⁵⁰ *Lockheed Martin Petition for Reconsideration*, at 2.

significant costs to the American public and economy from Ligado's proposal.⁵¹ This concern was echoed by Trimble, a leading provider of advanced positioning and productivity solutions using GPS, and a coalition of equipment manufacturers (the American Road & Transportation Builders Association, the American Farm Bureau Federation, and the Association of Equipment Manufacturers).⁵² Amici further identified an assortment of reasons why the *Ligado Order* was procedurally and substantively unlawful.

The FCC, almost four years later, has yet to finally resolve *any* of these many procedural and substantive objections to the *Ligado Order* or to decide the status of *any* of the eight pending petitions for reconsideration. In 2021, by a 3-2 partisan vote, the FCC denied NTIA's request for a stay of the *Ligado Order* but the FCC did not decide the NTIA's reconsideration petition.⁵³ And the FCC's stay decision was driven in part by the fact that Ligado had yet to begin, much less complete, many of the steps required by the *Ligado Order* before Ligado can launch terrestrial operations.⁵⁴

The *Ligado Order* has also yet to be challenged in court. Because a petition for reconsideration renders an FCC order non-final for purposes of judicial review, none of the many stakeholders who filed petitions for reconsideration has yet had the opportunity to challenge the *Ligado Order* under the Administrative Procedure Act in court. To be clear, amici agree with the

⁵¹ See Petition for Reconsideration of the Resilient Navigation and Timing Foundation, FCC IB Docket No. 11-109, at ii (May 22, 2020).

⁵² See *Trimble Petition for Reconsideration*, at 3; Joint Petition for Reconsideration of the Ass'n of Equipment Manufacturers et al., FCC IB Docket No. 11-109, at 6-8 (May 22, 2020).

⁵³ See Order Denying Motion to Stay, *LightSquared Technical Working Group Report LightSquared License Modification Application*, 36 FCC Rcd. 1262 (2021).

⁵⁴ See, e.g., *id.* ¶ 16.

United States that the lawfulness or not of the *Ligado Order* is not before this Court.⁵⁵ Amici highlight these petitions for reconsideration to confirm that Ligado’s proposal would in fact create harmful interference and, as explained below in Part II, to establish why Ligado cannot have a protected property interest in its highly contingent FCC license.

C. Subsequent Developments Have Confirmed Harmful Interference Risks Created By Ligado’s Proposal

Congress, too, promptly responded to the threats posed by the *Ligado Order*. In the 2021 National Defense Authorization Act (NDAA), Congress included several provisions to help neutralize the dangers created by the FCC’s decision, including by requiring DOD to arrange an independent evaluation of Ligado’s proposal with NAS—a private, non-profit society of distinguished scholars tasked with providing objective advice to the nation on matters related to science and technology.⁵⁶ According to Senator James Inhofe, one of the 2021 NDAA’s principal authors, the statutory provisions Congress enacted in the wake of the *Ligado Order* were necessary because Ligado’s proposed terrestrial network would “jeopardize our Nation’s [GPS], impacting ... the military and commercial aviation,” among other industries.⁵⁷ The 2021 NDAA provisions were adopted by what the Chair of the Senate Armed Services Committee described as one of the “largest group[s]” that has “ever come together” in opposition to a federal agency decision.⁵⁸

NAS’s subsequent study, mandated by the NDAA, confirmed in part what government agencies and amici had been saying for more than a decade—namely, that Ligado’s proposed

⁵⁵ U.S. Mot. 14-18.

⁵⁶ See National Academy of Sciences, *Mission*.

⁵⁷ 166 Cong. Rec. S7843 (2020) (statement of Sen. James Inhofe).

⁵⁸ *Id.*

terrestrial network would create significant harmful interference. NAS determined conclusively that “Iridium terminals will experience harmful interference on their downlink caused by Ligado user terminals operating” in certain bands “while those Iridium terminals are within a significant range of a Ligado emitter—up to 732 meters.”⁵⁹ NAS also concluded that transmissions from Ligado’s operations, while tolerable for some types of GPS devices, will jam certain high-precision GPS receivers,⁶⁰ used by DOD and civilians alike. The NAS study further confirmed that the proposed mitigation measures would be both financially and operationally unworkable.⁶¹ These NAS conclusions were reached in the public portions of its report. NAS created a classified supplement that further detailed interference concerns.⁶²

Widespread opposition persisted beyond the immediate aftermath of the *Ligado Order*. For example, in the 2022 National Defense Authorization Act, Congress once again took steps to address its concerns, this time by requiring DOD to “provide a briefing at the highest level of classification to the National Security Council, the Commerce Department, and the FCC commissioners on the potential for harmful interference from Ligado’s proposed commercial terrestrial operations to GPS, mobile-satellite services, or other tactical or strategic systems of DOD.”⁶³ Additionally, three years after the *Ligado Order*, more than ninety parties reiterated their concerns about the order and asked President Biden and Congress to work with the FCC to

⁵⁹ See National Academy of Sciences, *Analysis of Potential Interference Issues Related to FCC Order 20-48*, at 4-5 (2022) (“NAS Report”).

⁶⁰ *Id.* at 3-4, 42.

⁶¹ *Id.* at 5, 58.

⁶² National Academy of Sciences, *Analysis of Potential Interference Issues Related to FCC Order 20-48*, Public Briefing Slides, at 20 (noting DOD interference concerns based on classified testing).

⁶³ National Defense Authorization Act for Fiscal Year 2022, Pub. L. No. 117-81 (2022).

stay it; to address the information contained in the NAS Report, which “confirms that Ligado’s proposed terrestrial operations would cause harmful interference”; and to resolve the pending petitions for reconsideration.⁶⁴

II. REGULATORY UNCERTAINTY RENDERS LIGADO’S MODIFIED ATC AUTHORITY TOO CONTINGENT TO CONSTITUTE A COGNIZABLE PROPERTY INTEREST

The extensive, highly contested, and still unfinished FCC proceedings discussed above also establish why the United States is correct that Ligado has no vested, cognizable property interest in its FCC license for purposes of the Constitution’s Takings Clause.⁶⁵ The history of those proceedings puts beyond question that Ligado’s license is subject to multiple contingencies and uncertainties, including additional agency and judicial review (challenging the *Ligado Order*’s procedural and substantive unlawfulness). That history defeats Ligado’s takings claims.

It is axiomatic that, if a plaintiff “in a takings case” lacks “a cognizable interest in the property that was allegedly taken,” “that is the end of the matter.”⁶⁶ The government has argued that FCC spectrum-related licenses do not constitute a cognizable property interest, which disposes of Ligado’s complaint. Based on the text and structure of the Communications Act, as well as judicial and FCC precedent,⁶⁷ that appears to be correct, at least as a general matter.

⁶⁴ See, e.g., Letter from 91 Signatories to Senators and Members of Congress and Pres. Joseph R. Biden, Jr., at 2-3 (Apr. 24, 2023).

⁶⁵ See U.S. Mot. 19-27.

⁶⁶ *Biery v. United States*, 753 F.3d 1279, 1283 (Fed. Cir. 2014).

⁶⁷ See, e.g., 47 U.S.C. § 301; *FCC v. Sanders Bros. Radio Station*, 309 U.S. 470, 475 (1940); Report and Order and Second Report and Order, *Am. of Part 27 of the Commission’s Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, 25 FCC Rcd. 11710, 11736 ¶ 59 (2010).

But whether or not some FCC licenses could ever qualify as a cognizable property interest for takings purposes, Ligado’s “contingent” license certainly cannot.⁶⁸ A condition precedent for a cognizable property interest is that it is “vested,” which requires a “high threshold of certainty” in the interest.⁶⁹ Ligado’s FCC license cannot satisfy that standard.

For one thing, the FCC’s authority is derived from Congress⁷⁰ and, for that reason, Congress retains the constitutional authority to override FCC orders.⁷¹ In addition, FCC licenses remain subject to revocation or modification by the FCC itself.⁷² The contingent nature of Ligado’s license is underscored by the fact that the *Ligado Order* remains subject to further agency review—including the resolution of eight pending petitions for reconsideration that catalogue serious substantive and procedural flaws in the order⁷³—as well as certain judicial review by an Article III court when the FCC finally acts on the petitions. Moreover, Ligado’s apparent failure to take any meaningful steps to satisfy the conditions in the *Ligado Order* or to otherwise build out its terrestrial network makes clear that Ligado itself understands the uncertain and contingent nature of its terrestrial proposal.

In addition, amici agree with the United States that Ligado could not have had a reasonable expectation in the continued use of its satellite spectrum for terrestrial purposes,⁷⁴

⁶⁸ See *McCutchen v. United States*, 14 F.4th 1355, 1368 (Fed. Cir. 2021).

⁶⁹ See *Bowers v. Whitman*, 671 F.3d 905, 915 (9th Cir. 2012); see also BLACK’S LAW DICTIONARY (11th ed. 2019) (defining a “vested right” as “[a] right that so completely and definitely belongs to a person that it cannot be impaired or taken away without the person’s consent”).

⁷⁰ See 47 U.S.C. § 303 (delegating authority to the FCC).

⁷¹ See, e.g., Telecommunications Act of 1996, Pub. L. No. 104, § 202, 110 Stat. 56 (requiring the FCC to revise its broadcast ownership rules).

⁷² See 47 U.S.C. §§ 312, 316.

⁷³ See *supra* pp. 16-20.

⁷⁴ See U.S. Mot. 39-40, 42-43.

especially in light of the uncommonly broad and sustained opposition to the *Ligado Order* by the Executive Branch, Congress, and an array of private stakeholders. As just one example, within days of the *Ligado Order*, the Chairmen and Ranking Members of both the House and Senate Armed Services Committees warned that the *Ligado Order* puts “military readiness and even the defense of the homeland at risk.”⁷⁵ And large bipartisan groups of House and Senate lawmakers quickly demanded that the FCC reverse the *Ligado Order*.⁷⁶ Given that backdrop, Ligado could not have had a reasonable certainty in being able to carry out its terrestrial proposal.

CONCLUSION

The Court should grant the government’s motion to dismiss Ligado’s complaint.

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Respectfully submitted,

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⁷⁵ Sen. James Inhofe, Sen. Jack Reed, Rep. Adam Smith, & Rep. Mac Thornberry, Opinion, *FCC and Ligado Are Undermining GPS – And With It, Our Economy and National Security*, DEFENSE NEWS (Apr. 22, 2020).

⁷⁶ Letter from Sen. James M. Inhofe et al., to Chairman Ajit Pai et al., FCC IB Docket No. 11-109 (May 15, 2020); Letter from Rep. Adam Smith et al. to Chairman Ajit Pai (May 7, 2020).